# Retrigeration Service Engineer

VOL. 12 NO. 5

MAY . 1944





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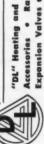
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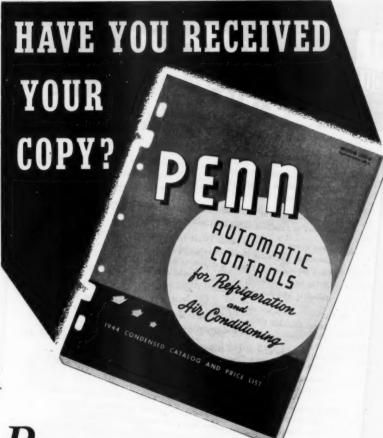
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  <u>Chloride supplies are adequate</u> to take care of refrigeration needs . . .

  put slow return of cylinders is still a prime cause of shipping delays.
- To speed up shipments, we will need every available cylinder. Refrigeration men can help by returning promptly to source of supply all empty cylinders.
- Don't keep around a number of partly filled cylinders, particularly those containing only a few pounds of Methyl Chloride. Wherever possible transfer amall amounts left in large cylinders to smaller containers . . . or partly empty cylinders . . . and return as many empties as you can. This will help keep cylinders moving.
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- Last year, we were able to give <u>reasonably good service</u> thanks to your fine cooperation. This year we are going to need your help more than ever because your refrigerant needs . . . and the other fellow's . . . are so much greater.
- Here's another way in which you can help. You can help yourself and the other refrigeration men. Look over your stock of full cylinders. If you have more than you need . . . please tell your source of supply about the surplus, so that it can be used if necessary to take care of any emergency needs.

<u>And don't forget</u>, order only what you need . . . use it up promptly and return empty cylinders immediately.

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COMPRESSORS—are in increasing demand due particularly to the growing replacement market which has resulted from restrictions or "freezing" of many types of equipment for the past three years. There are some critical materials in compressor manufacture and some manpower problems. But, deliveries are prompt on scheduled orders and a few weeks on individual lots. We suggest that you anticipate requirements at least two to three months.

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## The Refrigeration Service Engineer

Vol. 12

No. 5

#### May, 1944

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Ref igeration Systems and Oil Burners

Official Organ
REFRIGERATION SERVICE
ENGINEERS SOCIETY

#### The Cover

Battlefront refrigerator on wheels. Pvt. Clayton Lucas of Hammond, Ind., and Sqt. Edwin P. Golomski of Milwaukee, Wis., set thermostatic controls of their mobile refrigeration unit. (Acme photo)

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# Refrigeration Service Engineer

Vol. 12, No. 5

CHICAGO, MAY, 1944

\$2.00 Per Annum

# Sub-Zero Refrigeration—Problems of Application and Maintenance

By C. L. Olin\*

I T HAS been slightly more than a year since I first reported on the subject of "Low Temperature Refrigeration Requirements in War Production." Since then, a number of advances in the art have been made, and in the breadth of the range of uses of low temperature producing equipment. A review at this time might be of interest and because we at Servel have been exposed to many of these developments, we take pleasure in presenting the picture as we see it.

Time has exerted its stabilizing influence and currently the approach to any of the various problems is much more deliberate and scientific than was true two years or even eighteen months ago. And it is true that some of the "dramatic" aspect is lacking as compared to the popular conception originally.

It can still be said, however, that none of these fine high altitude bombers and fighter aircraft that are being produced today could leave the ground were it not for the application of controlled low temperatures used in instrument test apparatus.

Also, the benefits to metallurgy derived from the application of low temperature equipment have contributed a great deal to the speeding up of our war production machine.

The heat treatment of aluminum alloys utilizing low temperatures has had its part in the building of sturdy, rugged planes, increasing the strength of their structure and enabling them to withstand the strain of almost unbelievable speeds and of combat maneuvers.

In addition, the advances made in the processing of blood plasma and in the processing of that newest of discoveries, penicillin, have been possible because of the availability of controlled low temperatures.

The urgencies of war, the needs that simply have had to be filled regardless of cost, have called for bold venturing, and exploration of methods that would have been applied only with hesitation, and at best taken perhaps years to find acceptance, under peacetime economy.

Even so, we at Servel have found it necessary to extend a word of caution to the uninitiated who have felt that because they had been engaged in refrigeration activity in the past they could quite readily master these new sub-zero application problems in their stride.

To fully understand why we have counseled these people to stop, look and listen, one would have to be confronted with the

<sup>\*</sup>ER&AC Division, Servel, Inc. Paper presented before the Interprovincial Association R.S.E.S. Annual Meeting of March 20, 1944.

situations we have faced and are still encountering here and there, over the country.

As a typical example, let me tell you of a service engineer from a midwest city who appealed to us about two months ago to help solve a -70° F. application which he had been nursing for better than a year.

#### Testing Cabinets Devised

It seems about two years ago a local aircraft plant required a number of cabinets for testing instruments down to -70° F. It is true, not many sources for this type of apparatus had been established at the time but be that as it may, the job was attempted by a refrigerator dealer utilizing revamped domestic refrigerators.



Fig. 1—Single compressor type 3-stage condensing unit. (Servel, Inc.)

These were turned over on their backs, the legs removed and insulation added to the inside of the liners. Then plate type evaporators were applied and these connected to a rather standard (single stage) F-12 condensing unit (later charged with F-22).

The desired temperatures were never secured and one trouble after another finally resulted in this serivce engineer being required to be on the job almost constantly to keep at least some of these cabinets in operation.

We didn't want to become involved, as it appeared the job was a makeshift at best, but we finally agreed to sell this service engineer a single unit after first fully warning him that we could give him no assurance the results would be favorable. That was a month ago.

We received a letter from him the other day advising us the two-stage unit selected was operating very satisfactorily, the run-



Fig. 2—Aluminum sheet cooler. (Kold-Hold Manufacturing Company, Lansing, Mich.)

ning time was reduced to  $\frac{1}{3}$  and  $-70^{\circ}$  F. was being secured, whereas  $-50^{\circ}$  F. was the lowest that had been possible with the original set-up.

Frankly, in this case the user was simply lucky that the balance of the equipment (cabinet and evaporator) will apparently "get by," and that it is not going to be necessary to replace these as well as the condensing units.

In another case a U. S. Navy expeditor called us, frantically seeking help. He had an installation in mind utilizing conventional compressors that just wouldn't "stay put" but a few days at a time.

He had heard of the availability of special multistage condensing units designed for such work, and wouldn't we please help him in his predicament.

#### Lubrication Faulty

It was later found the principal fault of the original compressors was in the lubrication system, which only served to demonstrate that these applications are usually beyond the sphere of regular standard compressors.

In a third case the specifications called for a 20-hour pull-down time, down to —75° F. in a rather large walk-in test cooler. The equipment as installed actually required three days to reduce the temperature to —50°. In that instance a number of heat load sources had been overlooked, among them being the concrete in the floor and the residual heat of the insulation itself.

To correct the condition, considerable additional refrigerating capacity had to be supplied—both in evaporator and condensing unit—resulting in a loss of many dollars on the part of the seller or contractor.

Almost any number of such instances

might be repeated here. In general these difficulties have found their root in the attempt to apply the same practices that are applicable to conventional refrigeration work. There is a difference, and to better understand this, let us first review some of the significant characteristics of the condensing units being used in this sub-zero activity. For the purpose of this discussion, reference is made to those used in obtaining temperatures in the range of —50° F. to —120° F.

#### Cascade and Multistage Cycles

These fall into two general classes, those employing the cascade cycle, and those em-

ploying the multistage cycle.

In the cascade cycle, one condensing unit is used to refrigerate the condenser of a companion condensing unit (each condensing unit being complete in itself in all respects). This, of course, results in lowering the condensing pressure of the companion unit (or first stage as it might be termed). This cycle is used to advantage particularly where two different refrigerants are desired.

One manufacturer employs ethane in the companion unit (first stage) and propane in the second unit, or second stage. This permits securing low temperatures without operating below atmospheric pressure in the first stage evaporator, and a controlled temperature as low as —120° F. can be obtained.

With the availability of F-12 and particularly since the availability of F-22, it has been found a great majority of applications can be accommodated utilizing only the one refrigerant and the multistage condensing unit cycle.

Either method results in a reduction of the compression ratio and to secure the full benefit, the clearance volume in the cylinder must be held to a practical minimum.

By clearance volume is meant that volume above the piston (at the top of the discharge stroke) and around the piston valves, and including the volume of the discharge ports in the valve plate—all of which must be reduced as much as possible. However, since it cannot be climinated, at least some reexpansion in the cylinder must occur.

The adverse effect of this can be minimized where the discharge pressure is less; in other words, where the ratio of discharge to suction pressure is less, or, stated another way, where the compression ratio is less (expressed in pounds absolute pressure). Under these conditions, greater efficiency and ca-

pacity and lower temperatures can be secured.

For example, consider a conventional low temperature application, such as an ice cream cabinet. Here the suction pressure will run about 2 lbs. gauge (—15° F.) using F-12 and with a head pressure of 125 lbs. gauge, the ratio of the absolute pressure will be:

(125 + 14.7) is to (2 + 14.7) as 8.87 is to 1

Whereas a compression ratio of about 5 to 1 is considered a practical optimum, single-stage condensing units are regularly maintaining acceptable performance down to—40° F., under which conditions the compression ratio is approximately 15 to 1 (125 lbs. and 10.9 in. vacuum or 139.7 and 9.32 lbs. absolute).

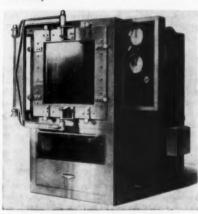


Fig. 3—Aircraft instrument test cabinet, stratospheric conditions. (Kold-Hold Mfg. Co., Lansing, Mich.)

Through the technique of compressor stag-% ing this compression ratio can be divided into steps, making it possible to operate each stage of compression closer to a practical ideal; for example, in a two-stage system operating at —75° F. in the evaporator and at 110 lbs. head pressure, the compression ratio sequence would be as follows:

First Stage: -75° F. corresponds to 28.01 in. vacuum or 8.4 lbs. absolute. The head pressure equals two lbs. or 16.7 lbs. absolute, or a compression ratio of 4.98 to 1.

Second Stage: Suction pressure (discharge of first stage) equals 2 lbs. or 16.7 lbs. absolute. Head pressure equals 110 or 124.7 lbs. absolute or a compression ratio of 7.45 to 1.

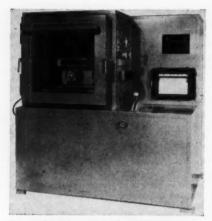


Fig. 4—High-low stratosphere instrument test cabinet. (Mobile Refrigeration Div., Bowser, Inc., Woodside, Long Island, N. Y.)

This would result in considerable improvement in efficiency. In fact, an attempt to accomplish the same operating condition with a single-stage type compressor would be practically impossible on any sort of a production basis. Similarly, where lower temperatures than —75° F. are desired, three-staging is used and the total compression ratio is divided into three steps.

#### Capacity and Performance Curve

Now let us examine a typical capacity and performance curve of a three-stage condensing unit (refer to curve of SE-101).

At -94° F. the gauge readings were as follows:

First stage suction: 26.2 in. or 1.88 lbs. absolute.

absolute. First stage discharge: 18.2 in. or 8.24 lbs.

absolute, or 4.5 to 1 comp. ratio.

Second stage suction: 13.2 in. or 8.24 lbs. absolute.

Second stage discharge: 8 lbs. ga. or 22.7 lbs. absolute, or 2.76 to 1 comp. ratio.

Third stage suction: 8 lbs. or 22.7 lbs. absolute.

Third stage discharge: 120 lbs. or 134.7 lbs. absolute or 5.92 to 1 comp. ratio.

It should be stated we have in each case incorporated a liquid refrigerant sub-cooler to remove heat from the liquid refrigerant entering the main (first stage) expansion valve. The more heat that can thus be removed, the greater will be the net effect of

the refrigerant entering the evaporator. Using a sub-cooler for this purpose is the most efficient method we have yet discovered, and we have established by experimentation the proper balance of heat removal at this point, for the various sizes of machines set up as standard models.

Our ratings are all qualified to apply where the liquid refrigerant temperature entering the expansion valve has been reduced to within predetermined limits, and we furnish full instructions relative to the subcooler design characteristics to accomplish this.

Now, coupled with these differences in cycle (as compared to the conventional single stage cycle) are the problems involved in securing a suitable liquid refrigerant flow control and space temperature control, particularly at the extremely low levels.

It might be said these phases of the complete operating cycle could be a study in themselves and this has in fact about proved true.

Some of the expansion valve people have come to the rescue with special valves with power elements so charged as to assure valve action responsive to bulb temperature even

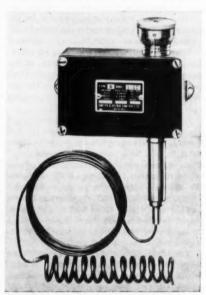


Fig. 5—Typical special thermostat range to minus 110° F. (Mfd. by United Electric Controls Co., Boston.)

the the bulb location temperature be reduced to below minus 100° F. It hasn't been an easy assignment and its solution required a great deal of experimentation under circumstances requiring unprecedented speed.

Likewise, thermostats have been made available by which it is now possible to hold very close differentials even at these extremely low temperatures—and, of course, such a control is not a three or five dollar item.

As if these were not enough to suggest care and caution, we have found it expedient to call attention also to the following:

1. Leakage per degree for a given insulation thickness at 150 to 200° T.D. can be anywhere from 1½ to 2½ times as high as that used for more conventional temperature differences.

2. Evaporators should have enough surface to handle the load at from 5 to 8° T.D. A temperature difference of 20° F. between coil and air is not unusual in normal commercial practice but if we can reduce this to 5° in a stratosphere cabinet, we will cut the size and cost on the condensing unit about 50%, to handle a given load.

#### Pressure Drop Reduces Capacity

3. Every precaution should be taken to avoid undue pressure drop in the evaporator and suction line.

A study of the properties of either F-12 or F-22 will reveal that as little as 2 pounds pressure drop can reduce the capacity as much as 40% (at -80° F. evaporator temperature—F-22, and 53% at -70° using F-12).

4. Motors of multistage condensing units are usually fully loaded at around —30° F. evaporator temperature and some method of keeping pressures below this point is necessary or the unit will fail to start initially or after a shutdown.

5. All possible heat sources such as lights, motors, and the product (including the evaporator mass in itself) should be calculated in determining the total load.

6. Care should be exercised in determining the load where a specified rate of pulldown is involved. For in reducing from one specified temperature to another, not only is leakage involved but the stored heat in all the internal material and parts, including the evaporator and about ½ of the mass of insulation, must also be taken into consideration.

 And lastly, a generous allowance should be included to provide for the cost of initial adjustment, changes and readjustment during the warranty period.

The point is, the successful "subzero" and "stratosphere" applications which have been made to date have in each case been the result of a carefully planned and comparatively long experimental program by each manufacturer. Test jobs have been set up based on the best available "paper" calculations, after which each element has been modified or replaced several times on a more or less "cut and try" basis until a practical working assembly was developed and then duplicated in production.



Fig. 6—Rivet storage cabinet equipped with canisters. (Kold-Hold Mfg. Co., Lansing, Mich.)

It is obvious, therefore, that even those firms having wide experience in ordinary refrigeration work cannot hope to seize upon a set of specifications for a "stratosphere" installation and promptly put in a bid with guaranteed performance, based on slide rule calculations and fule-of-thumb.

After hearing all this, you are probably asking yourselves these two questions:

First—Just where does the service engineer fit into this picture, and Second—What are the future prospects of development in this field currently and postwar?

In answer to the first question, let me say the service engineer is very definitely a vital factor. In so many, many cases the entire success of the finished installation has depended upon the intelligence and resourcefulness of the service engineer because it was he who kept those particular jobs in proper

and continuous operation.

One gentleman, prominent in our industry, has referred to the service engineer—the independent service engineer in particular—as the "sleeping giant." He had in mind the position of the service engineer in the postwar distribution of refrigeration equipment, but the reference could be as applicable to your present-day position as regards these sub-zero applications. A great deal depends upon you, and I don't believe you have been fully awake to the possibilities before you here.

Now for the second question.

To begin with, what about aircraft instrument testing?

#### Aircraft Instrument Testing

It is obvious that so long as the war lasts, the race will continue, in the production of faster planes to fly at higher altitudes. Therefore, every part of the operating mechanism, including engines, landing gear, panel instruments, super-chargers, oxygen valves and even complete sub-assemblies of the planes' structure must be tested for behavior under conditions existing in the stratosphere (namely, approximately —70° F. and 5.5" pressure absolute at 40,000 ft.)

This is an intensely important phase of production inspection. The complete "strat-

osphere chamber<sup>97</sup> includes evacuating equipment, heating elements and provisions for varying the humidity—in addition to the refrigeration apparatus involving mostly three-stage type condensing units.

As for postwar, it is generally conceded that we will, after peace is won, go on to even further explore and utilize stratosphere flying for commercial transportation. Continued need for suitable refrigerated test

apparatus is to be expected.

Secondly, aluminum alloys still stand out as the most suitable for basic aircraft construction. To secure the greatest strength, heat treatment will continue to be required, and by the same token, refrigeration will be required to hold the aluminum sheets, forgings, rivets, etc., in an annealed state until used in the plane. Temperatures currently used vary from  $-35^{\circ}$  F. to  $-50^{\circ}$  F. and both single and two-stage type condensing units are used.

Here, too, the need for this type of refrigeration is expected to extend into the postwar period.

Thirdly, in the field of stabilization of metals by low temperatures, the ground has

only been scratched.

Seasoning, or stabilizing precision gauges and tools "artificially," utilizing mechanical refrigeration, is a comparatively new practice. Devious and laborious methods were used heretofore, even to exposing the semicompletely machined parts to the elements for a season or two.



Fig. 7—Expansion fit processing, two-stage propane unit. Deepfreeze Santocel cabinet (Deepfreeze Div. Motor Products Corp.)

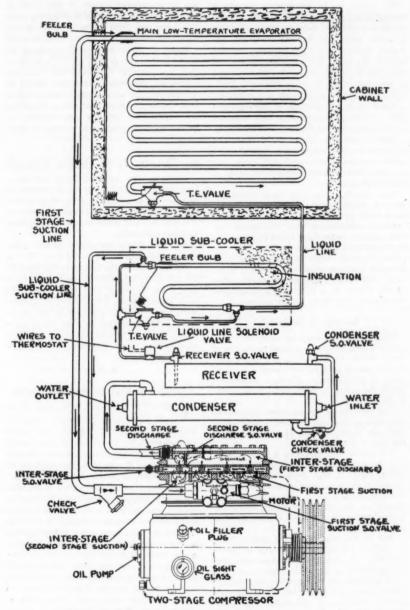


Fig. 8—Single compressor 2-stage refrigeration cycle (Servel, Inc.)

The point is, in non-ferrous metals a change takes place over a period of time which metallurgists refer to as growth; this at times takes the form of warpage, but usually appears as a slight irregular enlargement of the part. For precision gauges and tools this obviously cannot be tolerated and in the past many of these inherently high-cost parts had to be rejected and scrapped.

Speed in the production of these gauges and complete reliability have been obtained by the application of this artificial seasoning.

Here again the revelation of these advantages of low temperature refrigeration under impetus of war needs will carry over to contribute to more efficient handling of peacetime needs.

And, fourth, the field of "heat treatment" of alloy steels thru the use of low temperatures holds great promise.

Here, metallurgists have discovered cutting tool life (using high speed steel) can be improved from 800 to 400 per cent.

Metallurgists refer to securing a more complete conversion from one form of molecular structure to another, or precipitation of the carbon to a point where practically the utmost in hardness can be secured.

#### Savings in Materials

The savings in material—and more important, man hours—by extending the life of these cutting tools predicts a bright future for the use of subzero refrigeration in these types of applications. Findings to date indicate the optimum range to be from —100° F. to —150° F.

And the fifth on our list, blood plasma and penicillin processing, has been publicized so generally there is little to add here as to the future prospects.

It might be said, however, it is conceivable that the same method of dehydration (desiccation under a high vacuum) will be extended to the processing of many drugs and possibly certain foods. No change in the quality of the substance occurs under this method and no doubt much further development will take place.

And in manufacturing, the shrink fitting or rather the expansion fitting of parts, utilizing low temperatures, has only seen the beginning of its possibilities.

In addition, we will continue to need low temperature test apparatus for sundry laboratory testing, of oils, synthetic rubber, plastics, etc., etc.

And finally, it is certain we will be utiliz-

ing the knowledge gained in this work, in approaching the problems of designing postwar home and farm freezers, locker plants, ice cream cabinets and frozen food cabinets.

Many of these subzero applications respond to the same general service procedures that you service engineers are regularly employing. However, others are rather involved, not only as regarding the refrigeration apparatus proper, but also as regarding the accessories, controls and circuits required to accomplish wide ranges of functions.

#### An Opportunity for Service Engineers

The industry—in fact, to an important extent the war effort—will be dependent on you service engineers to keep these special subzero installations operating properly. I'm sure you will welcome this as a challenge and an opportunity.

In conclusion, let me say we all have something at stake here. We have a war to win.

Fortunately, in the refrigeration industry we can contribute most by continuing to do that thing we know best how to do. We have an obligation, I might say, to prepare ourselves to meet the problems of the day, to the end that wherever possible, no delay in production and no compromise in standards need be considered, for want of suitable refrigeration.

#### x x x

#### FREON PLANT IN PRODUCTION

A LMOST a full month in advance of the date on which production was expected to begin, the new addition to the Deepwater (N. J.) plant of the Kinetic Chemical Company has commenced delivery of supplies of Freon-12 refrigerant gas, the War Production Board announced.

Total April production of the plant, after the new addition had reached estimated capacity, was expected to be between 2,800,000 and 2,900,000 pounds. Officials of WPB indicated that the unexpected March addition would be utilized to replenish depleted warehouse stocks of Freon-12.

Completion of the New East Chicago (Ind.) freon plant of the same company will occur between August 18 and September 1, 1944, the date previously announced by WPB for the first production from this facility.

#### News Briefs on War Regulations

#### **WPB Short Cut** for Repair Materials

REPAIR services for many domestic appliances are being greatly handicapped, the War Production Board said recently, because many electrical and mechanical repair shops are not taking advantage of a WPB regulation designed especially to aid them in more readily obtaining parts and materials for their operations. These items of civilian equipment include refrigerators, washing machines and other electrical appliances, as well as radios, watches and clocks, bicycles, lawnmowers, sewing machines, stoves, automatic heating plants and

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Controlled Materials Plan Regulation No. 9-A provides that these shops may purchase in each calendar quarter up to twenty tons of carbon and alloy steel, 500 pounds of copper base alloy and brass mill and foundry products, and 200 pounds of aluminum in specified forms and shapes. In addition, electrical contractors, electricians, and repairmen of electrical appliances, radios and household refrigerators may purchase in a calendar quarter up to \$150 of copper wire, or one-eighth of what they used in making repairs during 1941. Under this regulation, a repairman may also buy as much other material and repair parts as he needs for his maintenance and repair work.

To buy these materials and parts a repairman need merely certify on his purchase order, in the form specified in the regulation, that he is applying the allotment symbol of V-3 and the preference rating of AA-3 which has been assigned by CMP Regulation 9-A. This eliminates the necessity of the repairman filing WPB-541 (formerly PD-1A) or CMP 4B applications and waiting for ratings or symbols to be assigned to him.

The material may not only be used for maintenance and repair work, but also for reconditioning and rebuilding a damaged or used item for resale; however, in such reconditioning or rebuilding, the item may not be improved from its original design. For example, a non-automatic iron may not be made automatic, and a treadle-operated sewing machine may not be converted to motor operation. Up to \$25 worth of material may also be used to install any unit of cooking, plumbing, heating, or used airconditioning or refrigeration equipment.

Although CMP Regulation 9-A was originally issued last November 25, letters from repairmen and a cross-country check of many repair shops has indicated that many repairmen are not familiar with the simplified form of obtaining parts and materials, WPB said. WPB is particularly concerned about keeping present appliances and equipment in operation since war needs make it necessary to curtail production of new products not urgently essential to the war effort.

Copies of CMP Regulation 9-A may be obtained from any of the 112 War Production Board field offices, or from the Electrical and Mechanical Repair Section, Service Trades Division, Office of Civilian Requirements, WPB Washington 25, D. C.

#### Restrict Deliveries of Freon-22

THE War Production Board acted April 21 to restrict deliveries of Freon-22, particularly for use in any system of comfort air conditioning and any installation for storing or dispensing carbonated or malt beverages.

Freon-22 gas is a comparatively new refrigerant and has, to date, been utilized mainly for low temperature experimental work, such as for testing flying clothes and instruments under simulated stratospheric conditions and for the shrinking of metals. The present inventory of F-22 is deemed insufficient to permit uncontrolled withdrawals, according to WPB.

Expectation that owners of refrigerating and air conditioning systems that have been prohibited from obtaining delivery of F-12 gas might attempt to substitute F-22, heretofore available without control, led to the issuance of this revision of Conservation Order M-28. With the revision the order

will be known as M-28-a.

Even with the imposition of these new restrictions on deliveries of F-22, WPB estimates that inventories of this refrigerant gas, at the present rate of authorized withdrawals, will drop to a critical low about July 1. Assurances were given by WPB that with these restrictions in operation, an

(Continued on page 42)

# Employers Advised on Deferment of Essential Employees

I N response to requests of employers for advice and assistance in dealing with selective service procedures, Office of Manpower Requirements has prepared a summary of the steps which an employer should take to obtain consideration for deferment of essential employees.

It must be emphasized that the War Production Board cannot undertake to assist in urgent cases until all local avenues of relief have been exhausted. It should also be remembered that an occupational deferment is granted for only one purpose, to allow time to train or obtain a replacement. The status of important cases is weakened if the employer has a record of presenting trivial cases or if the request for deferment of irreplaceable employees is accompanied by requests for consideration of employees whose essentiality is doubtful.

Instructions issued to State Selective Service Directors and Local Boards by the National Selective Service Headquarters specify in considerable detail the types of cases in which the Local Boards must give careful consideration to requests for occupational deferment. These are classified under essential and critical occupations.

#### Critical Occupations

If the employer feels reasonably certain that an employee, age 26 through 37, who has been classified in 1-A is qualified for and actually engaged in a critical occupation, he may file an affidavit to that effect with the Local Board. The case will then be treated in the following manner:

1. If the Local Board is satisfied that the registrant is qualified for a critical occupation but is not entitled to deferment on the basis of his present job, the matter must be referred to the local office of the United States Employment Service for investiga-

2. After such reference, the Order to Report for Induction will not be issued for 30 days or until the United States Employment Service reports on the case.

3. Within the 30-day period, the United States Employment Service office will in-

vestigate the registrant's duties and qualifications and may either certify to the Local Board that the man is employed in a critical job or arrange for the transfer of the man to another employer where his qualifications are fully utilized in a critical job.

4. If the Local Board receives no notification from the United States Employment Service, it may reclassify the registrant into

a class available for service.

5. Upon receipt of certification that the registrant is at present employing his highest skills in a critical job, the Local Board will reconsider his classification.

#### Contributory Occupations

In order to reduce turnover and to provide specified periods of deferment for men currently disqualified for any military service or qualified for limited military service only, Selective Service has provided for consideration for occupational classification for registrants ages 18 and over who by reason of their occupation are making a contribution in war production or in support of the war

At present registrants disqualified for military service by reason of physical disability are placed in Class IV-F. Such registrants may now be classified in Class II-A (F) or II-B (F) if they are "making a contribution" in support of the war effort or in war production. Registrants found qualified for limited service only and currently being placed in Class I-A (L) subject to call at any time when needed, may now be considered for classification in Class II-A (L) or II-B (L) if they are "making a contribution" in support of the war effort or in war production.

Request for such deferment is made by filing an up-to-date Form 42 or 42A or other evidence of occupational need, regardless of the registrant's age, and noting on the face of the request the words "Qualified for limited military service only" or "Disqualified for any military service," as the case may be. Registrants so deferred thus acquire a greater stability in their employment than if left in a physically deferred classification subject to recall by the armed forces at any time.

#### Age Factor and Consideration for Fathers

Registrants 18 through 25. No deferment may be granted on occupational grounds except when recommendation is made in each individual case by the State Director or the Director of Selective Service, whether nonfather or father.

For registrants ages 26 through 29 the requirements of a "necessary man" will be strictly applied, although fathers normally will be accorded occupational deferment in

preference to non-fathers.

For registrants ages 30 and over the "necessary men" requirements will be applied less strictly and fathers will be accorded more liberal consideration for occupational deferment than fathers under 30 and nonfathers, if all other factors are equal.

#### Other Occupations in Essential Activities

Local Boards may grant deferment to unskilled workers in essential activities if it can be demonstrated that the local labor shortage is so acute that serious disruption of war production may be created by the withdrawal of such employees in large numbers.

Selective Service policy prohibits the de-ferment of young men 18 through 25 years of age, on occupational grounds, except when their necessity and irreplaceability is certified as to each individual by the State Director of Selective Service. The State Director's certification will be given only on presentation of irrefutable evidence of the irreplaceability of the registrant in an activity considered highly critical to the prosecution of the war.

#### Requests for Deferment

The employer who wishes to request occupational deferment for an employee should file an Affidavit-Occupational Classification. In the case of men, 26 years of age and over, use the Selective Service Form 42A, which is filed with the Local Board.

In completing these affidavits, the employer should set forth the exact nature of the employee's duty; the company's efforts to train replacements; the degree of training, skill, and experience required; and efforts made to obtain acceptable substitutes or trainees, through the U.S. Employment Service and other employment agencies. The employer should supply evidence that every other man in the plant has been upgraded and cannot be used on the job in question.

These forms may be accompanied by references to any official releases or regulations, such as the list of essential activities, the list of critical occupations, and endorsements by a regional War Manpower Commission Director which would validate the company's

claim to essentiality.

#### Appeals

If the request for occupational deferment is denied and the employer is notified that the employee has been retained in Class 1-A. the employer may file an appeal within 10 days after the date of the notice. Any registrant is entitled to request personal hearing if he so desires. If the Local Board then reclassifies the registrant out of Class 1-A. the appeal is automatically dropped.

Attached to each Local Board is a government Appeal Agent whose duties are to appeal from any classification of the Local Board which, in his opinion, should be reviewed by the Board of Appeal, and to suggest to the Local Board a reopening of any case where the interests of justice require.

In the event the Appeal Board affirms the Local Board decision, the case may be brought to the State Director of the Selective Service with a request for review to determine whether the case should be reopened by the Local Board for reconsideration, or whether appeal to the President by the State Director is warranted. Occupational advisers attached to each State Director's headquarters are available to review occupational cases and advise registrants and employers of their rights as well as their responsibilities.

In the event the State Director declines either to request the Local Board to reconsider or to take a Presidential appeal and the employer has reason to believe the case has not received thorough consideration by the Local and State Selective Service Agencies, then he may send the case to the Director of Selective Service, Major General Lewis B. Hershey, 21st and C Streets, Northwest, Washington, D. C., with a request for The following information must be supplied:

(1) Employee's Selective Service classification, date of such classification, previous occupational classification, if any, age and marital status.

(2) Date of appeal and the vote, split or

unanimous, of the Appeal Board. (3) Employee's occupation and detailed description of his duties, including skills and previous training.

(4) The date of induction, if order to report has been issued.

(5) The date of referral to the State Director and the date of his decision.

(6) Complete explanation of employer's effort to train, upgrade, or obtain a replacement. It is the employer's responsibility to exhaust every possible effort to replace men liable for military service under the law.

It is important to remember that the mere fact that an employer has made his request to the State or National Director for reconsideration or for Presidential appeal does

(Continued on page 44)

#### Service Pointers

#### Practical Service Men Tell How They Meet New Repair and Service Problems

UNDER this department a number of practical service men show a commendable cooperative spirit in passing on to others information on special repair and service problems that may be of much value in these trying times of material scarcity and shortage of competent help. We believe if more readers would send similar contributions, making THE REFRIGERATION SERVICE ENGINEER a medium for the exchange of information on service, much benefit would accrue to all. Similar contributions are solicited from all readers.

#### HOW TO INSTALL A

A S demonstrated by A. E. Karlberg, manufacturer of Chicago Seals at a meeting of Chicago Chapter, R. S. E. S.

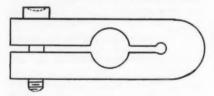
1. Remove the four bolts that hold meter frame to compressor.

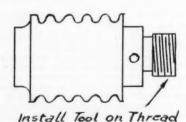
Remove the two nuts that hold compressor to the mounting springs. It is now possible to pull the compressor away from the motor and expose the seal.

The coupling may be removed by tapping an end sharply with a small hammer. Mr. Karlberg has devised a tool that eliminates the need for disassembling the compressor in order to get a hold for unscrewing the old seal.

This tool, tightened onto the threaded end of the old seal provides leverage and protects the thread from injury, should it be desired to save the old seal.

Use a short rod and a small hammer. Tap lightly and quickly on the head of the bolt, which has a depression to accommodate the rod. The steel will be loosened and may be turned off with the fingers. Operation of installing new seal is as follows:





Tool devised for removing seal from Coldspot unit.



No. 200 Seal No. Fits coupling using 13/32" with using

No. 215 Seal Fits coupling with hub using 15/32"

#### Installing New Seal

- 1. Clean shaft and old compressor seal face.
- Install new bronze face ring with neoprene insert against old seal face in compressor housing. This eliminates any need for lapping.
- Place seal sleeve with face against bronze face ring.
- 4. Place spring over seal sleeve as shown.
- Remove coupling from old seal and screw sleeve-lock into old coupling.

6. Screw sleeve-lock coupling and assembly onto shaft. (Hold assembly firmly when tightening coupling on shaft.)

Caution: Oil sleeve slightly on face before installing. Avoid oiling neoprene in bronze ring.

#### S S S

#### TESTING CAPACITORS

#### By Bernard Krosner

A SIMPLE test can be made by connecting the capacitor in series with a 200 watt lamp on the 110 Volts AC line.

a. If the lamp lights dimly or not at all the capacitor is open or weak.

b. If the capacitor lights very bright the capacitor is shorted.

c. A normal capacitor will cause the light to burn at about three-quarters of the full illumination.

#### x x x

Ed. Kertzman Winona, Minn.

I want to compliment you on the swell articles in The Refrigeration Service Engineer. I get a lot of good out of every issue. It is my conviction that after fifteen years of refrigeration work along all lines, I am beginning to find out how little I really know.

#### BOOK REVIEW

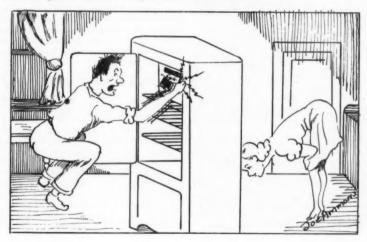
#### THE OXY-ACETYLENE HANDBOOK

A manual on oxy-acetylene welding and cutting procedures. Published by the Linde Air Products Co., New York, N. Y. Heavy cloth binding. Illustrated. 600 pages. Price \$1.50. For sale by Nickerson & Collins Co., Chicago, Ill.

This book furnishes a complete, comprehensive and authoritative text book on basic oxy-acetylene welding and cutting procedures. It may be used as a guide for self-instruction and also as a standard classroom text book in vocational and trade schools, technical high schools and engineering colleges.

It covers the entire range of the oxyacetylene process, giving instructions for handling all the common commercial metals, together with simple explanation of the fundamental principles of the various methods of depositing and controlling molten metal. The operating principles of oxyacetylene equipment are explained and instructions are given for its care and maintenance. Besides its use as a text book it also will be found valuable as a guide and reference for those who are engaged in work where the oxy-acetylene process is used. A topical index is included which adds to its value as a reference book.

## There! Leave it like that—Whatever it was you did then, made it run.



#### Refrigeration Equipment Manufacturers and Jobbers Hold National Meeting in Chicago

THE Refrigeration Jobbers and Manufacturers took advantage of their spring meetings in Chicago, April 24-26, to consult on joint problems and prepare for the peak season ahead. Considerable emphasis was also given in both groups to discussion of postwar developments and how best to handle them. The refrigeration service engineers were praised repeatedly for the effective job they have done to keep the nation's refrigeration equipment in operation despite wartime hardships and the long hours of work involved in the process.

#### Service Engineer Important

Sterling Smith, chief of the WPB Refrigeration Section emphasized in the jobbers meeting that the refrigeration service engineer is the backbone of the jobber's business and paid tribute to him for a difficult jobwell done. The position of the service man and his work in the past warrants the best possible support from all phases of the industry.

Mr. Smith urged the members of the industry to give careful attention to furnishing data on their operations when requested by their association or WPB. The government agency must know the facts on parts supply. It realizes that shortages waste time and complicate manpower problems. The situation regarding refrigeration repairs is especially dangerous now and WPB will do everything it can to alleviate it. There will be close follow-up to secure materials, machines and manpower so that manufacturers can produce the supplies required in the field.

Everything possible must be done, Mr. Smith declared, to increase the number of service men in the field. He emphasized the need for the full cooperation of everyone in the training program now in operation in the industry. All sections of the industry should also make plans ahead and do everything possible to assist in meeting the challenge of the present critical year.



A. B. SCHELLENBERG
President, Refrigeration Equipment
Manufacturers Association

The Refrigeration and Air Conditioning section has its plans set not only for the near future but also for reconversion as soon as that is practical. The problems have been studied by the task committee from the industry and the result will be a new Order L-38 to relax restrictions and set up programs for changed needs as they develop. Further steps in the program will be possible when the invasion has been successfully established.

#### Work of War Council Reviewed

Additional support for the refrigeration service industry was requested in a joint meeting of the two groups by Harry Alter, president of the jobbers and John Wyllie, former president of the equipment manufacturers. Mr. Alter reviewed the work of the war council in pointing its initial efforts toward conserving the manpower available for refrigeration repair. As a result of this work proper consideration was given last summer to the deferment of service men and as an outgrowth a remedial program was organized for manpower training. He

paid tribute to Ray Kromer for his intensive and effective work in directing the program. Then he introduced John Wyllie with expressions of industry appreciation for his accomplishments as chairman of the activity.

Mr. Wyllie suggested that the industry consider what would happen if refrigeration repair work were eliminated, a condition which now exists in some communities. In no community, he stated, are there enough repair men. While deferments were previously given, he pointed out that these were always on a temporary basis and the industry was faced with the necessity of training replacements. This training program has gained wide acceptance in the industry with 130 councils in operation and 78 schools organized with 5,000 students now learning and available to the industry to carry on a portion of its work.

He described the recent expansion of the National Refrigeration Service Council which brought additional men into the national organization to assist local councils and speed their work (R.S.E. April issue, Page 36). The contributions of the government and other agencies to the program have represented more money than the sums expended by the Refrigeration Industry itself. For instance, the U.S. Vocational Educational Department has provided text books and class rooms and has paid the salary of the teachers. The Power Companies have furnished a number of men to get the program started and carry it along. Yet money is needed by the Service Council to publish the training handbook and defray out-ofpocket expense for the publishing of bulletins and doing other necessary work.

In this connection he pointed out that there is no salary expense because the various council workers are giving their time. Requesting financial support to cover these necessary expenses, Mr. Wyllie announced that a campaign would be launched shortly to secure industry contributions and urged the members of the industry to contribute funds for maintaining the program and expanding it to fulfill present needs.

#### Future of the Industry

Many phases of the Refrigeration Industry's future course were described by George Taubeneck, of Detroit, Mich. In answer to specific questions he discussed the pattern of postwar developments in the industry. Hermetic refrigeration units he declared are definitely on the way in larger and larger



John Wyllie, Chairman, and Ray Kromer, Director of National Refrigeration Service Council.

sizes. Many of these will make their appearance shortly after the war and the industry should make plans with this development in view. Among other suggestions he predicted that parts and service lines would be broadened to include the fields of washing machines, aircraft parts and radio service and equipment.

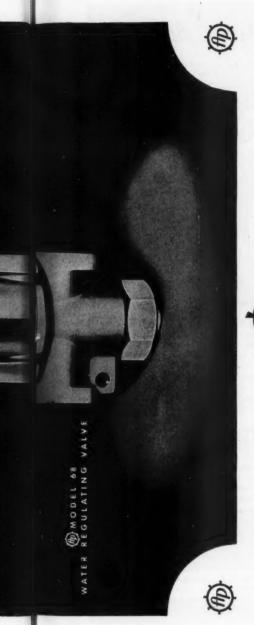
He envisioned new fields for refrigeration which in the past has primarily been concerned with preservation of goods already produced. In the future there will be more emphasis on refrigeration in productive processes. The refrigeration of food and of air to promote more comfortable conditions will continue to expand in accordance with the pattern already established. One field promising considerable expansion is refrigeration on the farm to increase production, save labor and permit better utilization of farm products. Air conditioning will develop as a more important part of production processes, as well as to provide comfort for workers, customers and in the home.

The war has brought increased appreciation of the effect of refrigeration on molecular structure, and much wider use of low temperatures is envisioned in numerous sections of the manufacturing industry. Mr. Taubeneck anticipated broadened use of refrigeration by the medical profession to alleviate suffering and aid in medical treatment. The war has also speeded the development of new techniques in this field. In summary he pointed out that many of the developments mentioned have come from without the refrigeration industry and suggested that the industry provide for its own research to accelerate such application.

(Continued on page 40)







A compressors and condensing coils. Improves operating efficiency and economy through closer, more uniform control. Features long stroke, NONTROLS flow of water for water cooled self-cleaning valve stem; prevents compressor

pulsation; easy space-saving adjustment. Eliminates chattering, water-hammer and other noises.

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RECOMMENDED AND INSTALLED BY LEADING REFRIGERATION SERVICE ENGINEERS STOCKED AND SOLD BY PROGRESSIVE REFRIGERATION JOSEERS EVERYWHERE ..

#### The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment to "The Question Box."

#### BUILDING DEEP-FREEZE CABINET

OUESTION 599: I am building a deepfreeze cabinet and will greatly appreciate your assistance regarding the length of tubing to be used. The cabinet has a capacity of 6 cu. ft., four inch cork insulation, sheet metal lining and one inch boards on the outside. I will use a Chieftain 1/5 hp. hermetic condensing unit and Freon gas. The unit has a fan. I may use either an expansion of thermostatic valve, thermostat or low pressure control. I intend to solder the tubing to a sheet metal plate, wound in a spiral about one inch between rounds to reduce the length of tubing. I would like to have a back pressure of about zero or 3.5 lbs. at a cabinet temperature of zero to five below zero. Of course, the unit should be capable of pulling the temperature down to about 10°F. below zero. The room temperature will be between 60° and 70°.

I intend to use either % inch or half inch tubing, whichever will be available and the question is: What length of tubing in either % or ½ inch will this setup require? Would you recommend two plates or one?

Answer: It is rather difficult to determine the exact amount of tubing required in a freezer cabinet such as you are building without knowing a good deal more than what you have told me.

One thing in particular that affects the load imposed on the unit is the amount of food to be frozen at any one time or over a period of 24 hours. The kinds of food also is a factor, but since you probably have little idea at the present time of what foods will be placed in the cabinet, we cannot arrive at an estimate of this load.

I would think then that the best plan is to put in as much tubing as is convenient, putting it all into shelves in the manner you have suggested. The greater the evaporator area contained in the refrigerated space, the higher your back pressures will be in operating. Since a higher back pressure is a desirable feature, it will be advisable to put in an excess of tubing rather than a minimum.

I think you will require at least 80 ft. of

half inch tubing, and if it is possible, I would suggest you use as much as 50 ft.

#### INSULATION VALUES

QUESTION 600: What is the comparative value of Pelco wool and cork? Some use 10 in., 12 in., or 14 in. for locker storage. Which would you say is the best?

Answer: The "K" factor or conductivity of Palco wool as given by its manufacturers is .255, while sheet cork has a "K" factor of .283—thus, Palco wool has a lower insulating value than cork. I think the average thickness recommended in locker plants is 10 inches, except in the freezing room where 12 inches is used on the outside walls.

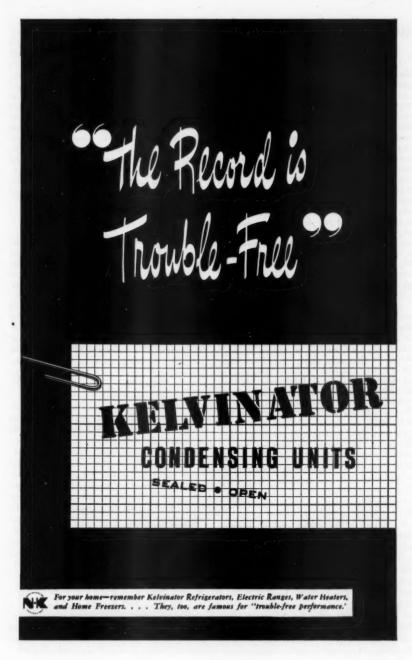
It is the usual practice, however, to construct the freezing room inside the plant itself so that there are no walls exposed to outside temperatures—thus, it is not necessary to use more insulation in these walls. The cost of increasing the wall thickness to 12 inches is not so great and would pay dividends where the actual temperature rises above 100 degrees during the summer, or if it were used on those walls exposed to sunshine. I don't think 14 inches is necessary in the state of Wisconsin.

#### MAKING A COLD STORAGE BOX

QUESTION 601: I want to make a small cold storage box for meat using a 1/5 hp. motor, but I am not sure of how large a box I should use, or how many cubic feet it will take care of. How many feet of %" tubing will I need for the cooling coil? I will use 2½ inch insulation of Santocel No. 45 and Freon gas.

Answer: A 1/5 hp. condensing unit would take care of about a 6 cu. ft. refrigerator. The evaporator would require about 50 ft. of ½ in. copper tubing. I would suggest, however, that you use 8 in. of insulation instead of 2½ in.

For a meat storage box, you will probably desire a temperature of about 38 degrees and I am afraid that  $2\frac{1}{2}$  in. of insulation would hardly be sufficient for this temperature.



## SUPER-COLD DOES NOT REGULATE PROPERLY

QUESTION 602: I have an 8 ft. Super-Cold show case to service. It is charged with methyl and has three \%" coils with a double row at the top, a single row in the center and a single row at the bottom. It had an Alco expansion valve expanding into the bottom of the top coil, then down to the center coil and to the bottom coil extending to the compressor. The expansion valve was located in the bottom of the case connected to the coil by 21/2 ft. of 1/4 in. tubing. This case would defrost the center coil, while the top and bottom coils were frosted, closing the expansion valve and shutting off the compressor before the case was down to a temperature of 36° or 34°. I opened the expansion valve a quarter of a turn and then all the coils would frost and the temperature was O.K., but then it would back frost to the compressor. I changed the expansion valve to about 6 in. of coil at the top of the case and replaced it with a new A.P. valve, but it didn't do any good.

I read about a Super-Cold oil clogged ice cream box in the January issue of The Refrigeration Service Encineer and did as it advised, warming all the coils, but to no avail. I used methyl to charge it as it stated on the name plate, purged out some of it to stop the back frost and then charged in more methyl, but it didn't help. If I cut down the expansion valve, the unit will not cut in until the case is around 45° or 50° R. Now would you advise putting in about 6 to 8 ft. of 3%" tubing on the inside back of the case as a drier coil to stop the back frost? Should a compressor be speeded up for methyl more than for SO<sub>2</sub>? I have changed over from methyl to SO<sub>2</sub> in a household box.

Answer: The first thing we must recognize about this 8 ft. Super-Cold show case you describe is that the greater part of the load is being carried by the coil in the top of the case. The center coil is intended primarily as a means of keeping the bottom of the meat pans cold.

The lower coil will carry very little load because the natural circulation in the show case permits the cold air to settle to the bottom, while the warm air rises to the top. I believe your trouble is due to the location of the expansion valve which, according to your diagram, is in the coldest area of the case, or in other words, at the bottom of the case.

Expansion valves are charged with a refrigerant, as you know, and if the valve itself is located in the coldest area while the bulb is in the warmer area, the refrigerant will naturally condense in the coldest area; thus, taking the control away from the bulb of the valve condensing all the refrigerant in the diaphragm of the valve. Erratic action will result and consequent difficulty in obtaining adjustment. I would suggest that this expansion valve be located at the top of the case near the top coil and that the control bulb be located at the outlet of the bottom coil. It will probably be necessary to include a length of drier coil between the control bulb and the point where the suction line leaves the cabinet.

#### Temporary Frosting of Return Line

Another difficulty that may develop due to this arrangement is a temporary frosting of the return line each time the machine starts, which may be due to the fact that during the off cycle, the refrigerant may condense in the lower coil; then, when the machine starts, this liquid refrigerant will be forced into the suction line, frosting it until such time as the liquid has been all evaporated—then the frost on the return line will disappear. To overcome this, it may be necessary to change the hook-up of the coils, allowing refrigerant to pass through the top coil first, then the bottom coil and finally through the center coil.

When changing a compressor from sulphur dioxide to methyl, it is necessary to reduce the speed, unless you are putting on a larger motor. In other words, when changing to methyl chloride, you are increasing the capacity at that speed. With the same speed and same size motor, you are imposing a heavier load on the motor and will most likely overload it to the extent that it will kick out on the overload control. To offset this, it is necessary to reduce the speed of the compressor by about ½ or increase the motor size by about ½ When changing from methyl to SO<sub>2</sub>, the reverse changes in speed on motor size are necessary.

#### × × ×

R. Robinson,

New York, N. Y.

I have derived a great source of information from past issues of this magazine and find that it is a publication of inestimable value.

## HERE ARE SOME IDEAS THAT WILL HELP YOU

IN / Jesigning

#### FROZEN FOOD CABINETS

Thinking in terms of new ideas, new designs and new markets, frozen food manufacturers should be interested in Temprite's Engineering Service in the designing of their new products. This "Temprite Service" is provided to assist your designers in the application of Temprite's standard accessories or the redesign of standard items where they do not meet your exact requirements.

The Temprite accessories listed below may suggest an idea that will increase the efficiency of your units.

Temprite's Two Temperature Valve is the ideal valve to use on frozen food cabinets when two or more different temperatures are to be maintained in the one cabinet. These valves are extremely sensitive and carbe adjusted for any desired temperature.

Temprite's Oil Separators are invaluable in all low temperature systems because they keep crankcase oil out of the evaporator and evaporator refrigerant, thereby obtaining the maximum efficiency and lowest temperatures under all conditions.

Temprite's Accumulator-Interchanger provides a means of using low temperature suction gas to precool incoming liquid refrigerant and also provides a practical method of utilizing the refrigeration

effect of raw refrigerant liquid which may leave the evaporator, by storing it until the warm liquid line refrigerant can make use of this available cooling effect.

A letter sent to our sales department today will bring you prompt information about the above Tempette products and Tempette products and Tempette products and Tempette are Instantaneous Xerney in are Instantaneous Xerney Coolers. III-Nide Playta, Sada Fountain Coolers, Photo Developing Coolers and Equations Tanks.

## TEMPRITE PRODUCTS CORP.

Originators of Instantaneou.



Liquid Cooling Devices

45 PIQUETTE AVENUE

DETROIT, MICHIGAN

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## RSES Members Help Keep Air Conditioning Plant at High Efficiency

By Stanford E. Moses, Jr.\*

PURVEYOR of fresh filtered air at controlled temperatures to 40,000 employees in the largest windowless factory in the U. S. is the air conditioning department of plant engineering.

. In the words of a visiting air conditioning engineer, the Douglas Long Beach plant has one of the outstanding air conditioning installations in the U.S. He writes:

"California usually runs to superlatives, and the Douglas Aircraft company plant at Long Beach is no exception. It is one of the largest single aircraft manufacturing plants in the United States, and it is also one of the largest air conditioned factories."

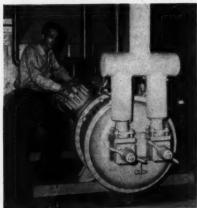
Its windowless insulated construction was instituted a year before Pearl Harbor by

government designers for wartime air raid conditions, the farsighted reasons for which have recently been relaxed. This does not detract from the fact that the plant remains a model of the decentralized type of air conditioning, the first of its kind installed in a large industrial plant.

The decentralized system has the additional advantage in a plant spread over many acres of saving approximately 20 per cent on the installation and the operating cost of long pipe line runs and auxiliary equipment which would have been necessary in a centralized system.

The Long Beach installation has 125 separate refrigeration systems totaling more than 10,000 horse power (approximately the same horsepower as is required for four twin-engined C-47 Skytrains). The same fans that disperse the cold air when needed pass air over the heating coils when heating is required.

\*Industrial & Public Relations, Douglas Long Beach Plant, Douglas Aircraft Co., Inc.



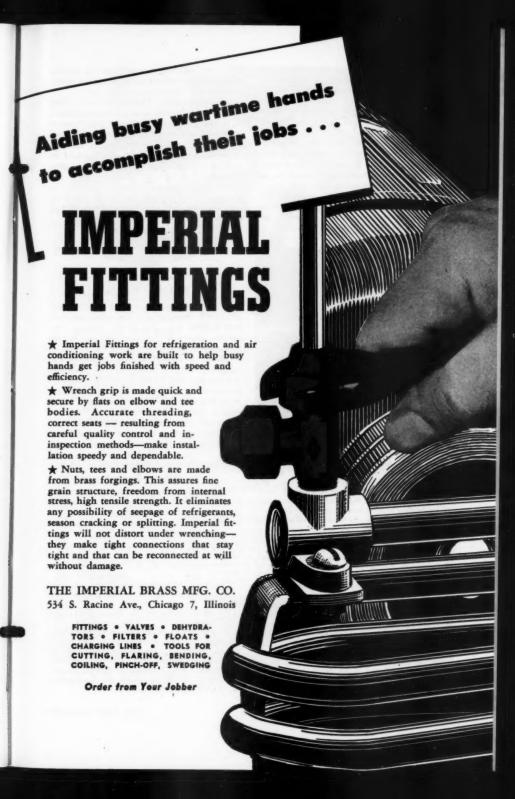
Air Conditioning Man—Joe Schumacher, member of the Long Baach Chapter, R.S.E.S., air conditioning operator for the swingshift does his lonely job far above the milling throng of assembly line workers in Bldg. 2. With the Invasion in the offing, Joe will keep C-47 workers cool while they exert themselves to meet the Army's extra demands in the coming months.

#### Air Filters

There are 8,000 air filters throughout all buildings which keep dust and impurities out of the plant atmosphere. In addition to the regular air conditioning equipment there are approximately 50 exhauster systems which remove fumes and oders from processing, dust and foreign material from buffers, grinders, etc.

The combination of refrigeration and heating in the decentralized system makes close control of temperature and air conditions possible. So much so that the same building can have heating in some areas and cooling in others. Occasionally in certain areas heat generated by the work going on will increase temperatures beyond the prevailing level but the general effect is so even that only a mininum number of complaints are registered because of discomfort from the atmosphere.

Many factors are important in maintaining the best inside atmospheric conditions.



To make possible heating and cooling in the same building, for instance, all systems are extensively zoned, and each building has one attendant on each shift whose sole duty is to check and service the intricate combination of equipment that keeps the balance right.

His duties take him from the boilers on the ground floor to the air conditioning units along the cat walks 40 feet over the workers below, and throughout the building to see that the fans, thermostats and other auxiliary equipment is functioning properly.

The air conditioning system has an almost unbelievable heat absorbing capacity, according to F. A. Thomassen, supervisor of



Keeps Inside Climate Right.—T. M. Langwell, member of the Long Beach Chapter, R.S.E.S. and swingshift air conditioning operator, who works 40 feet above the floor in Bldg. 12, tending what he claims is the most valuable amount of equipment trusted to any individual employee in the plant. The fan he works on here supplies approximately 40,000 cubic feet of air per minute, and he has 26 such units to look after, in addition to fans throughout the building and in the peaint booths. According to Mr. Langwell, Building 12 is one of 17 and the largest of them all. There are twice as many people in this building then in any other. Under his care are 26 York 6 cylinder compressors, 5 boilers, 12 rivet boxes and many supply and exhaust fans. The building is nearly a quarter of a mile long, 300 feet wide and over 50 ft, high. Mr. Langwell's daily rounds covers this area both on the floor and on the cat walks 40 ft. above the ground. Mr. Langwell was in the Navy in World War I and according to his statement is "Proud to be doing a job in this war and to be entrusted with so much important equipment."

Dept. 716, which is the equivalent of melting approximately 8,000 tons of ice in 24 hours. It is used to capacity on a hot day.

In cold weather Thomassen says, when outside air is needed as much for ventilation as in the hot spells, enormous quantities of heat must be added to the air for health and comfort. This heat is supplied by 42 large steam boilers, any one of which would be capable of heating a large downtown office building.

Such is the mammoth task of Dept. 716 in keeping Douglas men and women healthy and comfortable while they set new and bigger production records.

#### S S S

## MANUFACTURERS AND JOBBERS MEET

(Continued from page 31)

#### Post-War Planning

Both associations arranged specific programs for interchange of operating information helpful now and in the future. The various phases of postwar planning by the government were described by H. B. McCoy of the U.S. Department of Commerce who suggested careful study of the materials published to date by the government on postwar planning. He also answered questions regarding disposal by the government of the various surplus war materials on hand now and available in the future. Some of these patterns have been in use in the past but it was suggested that new methods are indicated because of the tremendous volumes involved in connection with the present war.

#### Officers Elected

During their meeting the Refrigeration Equipment Manufacturers Association held their annual election of officers with the following men elected to serve the association during the year:

President, A. B. Schellenberg, St. Louis, Mo.

Vice-president, F. J. Hood, Marinette, Wis.

Treasurer, J. A. Strachan, Cleveland, Ohio. Secretary, George R. Allen, Port Huron, Mich.

Executive Secretary, R. Kennedy Hanson,

Pittsburgh, Pa.
Board of Directors: Charles H. Benson,
Chicago, Ill.; Ivan Corcoran, Detroit, Mich.;
E. M. Flannery, Hartford, Conn.; R. H.
Luscombe, Goshen, Ind.; J. P. Rainbault,
Bloomfield, N. J.; Frank K. Smith, Tecumseh, Mich.; H. F. Spoehrer, St. Louis, Mo.;
R. O. White, Monrovia, Calif.



Due to its features of design the Henry "Y" Strainer not only gives complete protection to condensing unit and control equipment against scale and foreign matter that may be present in the system, but it also permits easy servicing with a minimum of interruption to plant operation.

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- Light in weight due to its tubular construction.
- 2 The strainer screen can be easily and quickly cleaned without removing the strainer from the line.
- 3 "Wave-Flow" design results in negligible pressure drop.
- 4 Cleaning seldom necessary because of large screen area.
- Internal baffle prevents injury to the heavily reinforced monel screen. In this connection it is well to remember that suction velocities may exceed 5,000 feet per minute.
- Patented forged steel clean-out flange is distortion-proof, making α tongue and groove anchored-gasket joint with strainer body.
- Strainer is of welded steel construction. Rustproofed.
  Available with copper sockets for O.D. tubing and steel F.P.T. connections for iron pipe.

Available in %" to 3%" O.D.S. sizes and in 1" to 3" F.P.T. sizes with screen area ranging from 23 to 175 square inches.

## FOR SUCTION OR LIQUID LINES



The Henry "Y" Strainer when used in suction line service will not trap oil if the strainer is installed on its side as shown.



For liquid line service the Henry "Y" Strainer can be installed either in a horizontal or vertical position.

#### Why the Patented Henry Flange Is Distortion Proof



Strains due to uneven or excessive tightening of bolts are absorbed in the recessed area (Å) and cannot be transferred to the flange gasket face (B) made up of the inner flange rim and the strainer housing to which the flange is welded. Lip on outer flange rim (C) acts as a "stop" to prevent excessive drawing up of bolts. Gasket is located in recessed area (D). Flange makes tongue and groove anchored-gasket joint with strainer.

HENRY VALVE COMPANY
3260 WEST GRAND AVE., CHICAGO 51, ILL.
5010 BY LEADING JOBERS EVERYWHERE

PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

## JOBBERS AWARD TO DETROIT LUBRICATOR COMPANY

THE annual first award of the National Refrigeration Supply Jobbers Association was presented at its spring meeting to the Detroit Lubricator Company. In annuancing the winner for the first year, Harry Alter, president of the jobbers group pointed out that the winner chosen from manufacturers of refrigeration parts and supplies, was the one whose policies, product quality and promotion were considered outstanding by the jobbers.



Harry Alter (left) presents jobbers award to Joe Krall.

The silver cup emblematic of the award was accepted by Joe Krall of the Detroit Lubricator Company. He reviewed the cf-forts his company had made to keep an adequate supply of parts flowing to the industry at the same time the company was devoting 56 per cent of its production to the manufacture of new devices used in the war effort. On behalf of his company he expressed appreciation to the jobbers for the award.

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#### WAR REGULATIONS

(Continued from page 25)

adequate supply will be available for those systems designed specifically to use this gas for war production purposes.

The types of refrigerating systems and comfort cooling installations which come under these new restrictions, in addition to those operated by civilians, include those operated by the Army, Navy, Maritime Commission or War Shipping Administration, including post exchanges and ships service stores, other than those used aboard ships.

## SURVEY SHOWS CONDITIONS IN JOBBING TRADE

A SURVEY report issued by the National Refrigeration Supply Jobbers Association presents some valuable information regarding conditions in the refrigeration supply jobbing trade. This report is based on a questionnaire sent by the Association to its members. Some of its findings are as follows:

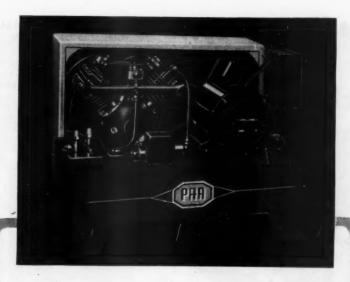
Present inventory of parts plus anticipated second quarter deliveries appear to be wholly inadequate for the present and near future demand for both domestic and commercial replacement parts.

More adequate inventories are needed. Everyone seems to think that the average repairman will save considerable time if parts and supplies are more readily available. The War Manpower Commission estimates that only 5,000 refrigerator repair men are now in the field as against 20,000 in peace times. If parts and supplies were more freely available there would be more man-hours left for repair work and less time would be wasted in purchasing parts.

The average repair man, it is estimated, devotes about 26 per cent of his time to repairing parts which in normal times would be discarded. Because of existing shortages in controls, expansion valves, compressors, motors and other components of a refrigeration system the repairman devotes too much of his time to tinkering and repairing. A plentiful supply of such components and parts would go far toward providing vitally needed man hours in actual field refrigeration repair.

Only the most experienced and proficient men are capable of repairing such components, and then their work is often wasted by other failures in such parts. Freeing the time of these repairmen so that more owners of refrigeration equipment might have their services would be a tremendous contribution to the health, welfare, and economy of the nation.

A sales and stock trend survey made by N. R. S. J. A. for February showed that there was an increase in sales of parts and supplies of 65.01 per cent for the first two months of 1944 over the same period in 1943, and that inventories decreased 8.85 per cent. This would indicate that stocks are probably at their lowest point in recent years and demand is greatly increased.



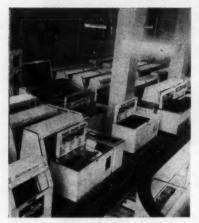
## Par Model HA-20

- A big air cooled unit for applications where low cost abundant water supply is not available.
- 2 H.P. 4 cylinder model with extra large surface condenser to give efficient service.
- For large soda fountains, dairy coolers, reach-ins and walk-in coolers.
  - Write for illustrated brochure of details.
  - . BY COMPARISON-YOU'LL BUY PAR.

PAR Division

MANUFACTURING CORPORATION Defiance, Ohio, U.S.A.

## Are You in a Spot for Lack of Equipment?



A Corner of our Medison Avenue Display Floor

In this period of equipment scarcity the New York market affords the best source of supply for refrigeration equipment. Complete Refrigerator Supply is in a position to offer you reconditioned equipment without restriction and new equipment for properly extended priorities.

Available from our large stocks are frosted food cabinets, farm freezers, reach in cabinets, display cases, condensing units, coils, valves, tubing, etc. Also job lots of refrigerating equipment of all types.

We suggest you write us about any of your requirements. We will gladly act as your New York source of supply and buying agents.

#### Complete Refrigerator Supply

Main Office & Showroom 95 Madison Avenue, New York 16, N. Y. Telephone: Lexington 2-5167-8

## SNELL ESTABLISHES WHOLESALE BUSINESS IN DALLAS

ORGANIZATION of the Snell Refrigeration Supply Company of Dallas, Texas is announced by Lou Snell. His business associate is Lt. (jg) C. W. Dennis of Washington, D. C., who operates a refrigeration wholesale business at Sioux City and Des Moines, Iowa. Mr. Snell has been associated with the Lynch Manufacturing Corporation of Defiance, Ohio, for the past eight years as district sales manager.



L. M. SNELL, Dallas, Texas

Many of the leading refrigeration equipment and supply manufacturers will be represented in the line of parts and accessories handled. Prior to joining Lynch, Mr. Snell was employed by Brunner Mfg. Co. of Utica, N. Y.

#### S S S

#### DEFERMENT OF EMPLOYEES

(Continued from page 27)

not in itself stay induction. It is therefore necessary to keep in contact with the State Director to insure that no undue delays occur.

A replacement schedule is a reciprocal agreement between Selective Service and the employer that workers will be released at a stipulated rate intended to enable the company to effect replacements without a serious dislocation of its operations. Use of the replacement schedule is voluntary, but only those firms whose activities are essential to the war effort may participate. The State Headquarters Occupational Advisory Staff should be consulted to determine whether the Replacement Schedule Plan can be applied to the employer's activity.



# SUPERIOR VALVE & FITTINGS COMPANY PITTSBURGH 26, PENNSYLVANIA

OFFICES IN PRINCIPAL CITIES . WEST COAST STOCK: LOS ANGELES (15) . JOBBERS EVERYWHERE



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Individually tested for efficient, economical operation. WP regulating valves may be mounted in any position and will give lasting, trouble-free performance. Brass body, two ply power bellows and corrosion resistant materials for all internal parts. They are designed not only to start and stop the flow of water but also to feed the economic amount of cooling water to secure the proper condensing pressure without waste. The water flow increases and decreases with the rise and fall of actuating pressure.

WP regulating valves are available in %", ½" and %" FPT sizes and other valves of other types are available in sizes ranging from %" to 2" FPT.

Write for a copy of our latest catalog.



## GUNTHER HEADS REFRIGERATION SCHOOL AT CAMP LEE

MAJOR RAYMOND C. GUNTHER of Paterson, N. J., has been appointed officer in charge of the Refrigeration School in the Quartermaster Replacement Training Center at Camp Lee, Va. Experienced in civilian life as a special engineering and refrigeration consultant and advisor on lubrication system design to industrial machinery manufacturers, he has had a wide Army background since receiving his commission in 1938.



Major Raymond C. Gunther, head of the OMRTC at Camp Lee, Va., looks on while a trainee in the school repairs a joint on an evaporator coil.

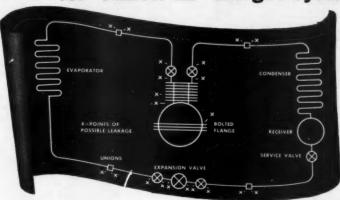
Following his graduation from Pratt Institute in 1928, Major Gunther served with the Carrier Engineering Corp. as air conditioning and refrigeration engineer for three years. Later he was connected with the Socony-Vacuum Oil Company as a lubrication engineer and specialist on refrigeration, railway and machine shop lubrication. For railway and machine shop lubrication.

#### S S S

#### SCHOOL FOR SERVICE MEN

A FIVE-day school for refrigeration service men was held May 8 to 12 at the Tri-City Service, Inc., Cincinnati, Ohio, under sponsorship of Nash-Kelvinator Corporation to help conserve existing refrigerators for the duration of the war. Men from Ohio, Indiana and Kentucky were assembled. Classes from 8:30 a. m. to 5 p. m. were held with J. K. Stewart, zone service manager for Nash-Kelvinator in charge.

# MAINTENANCE TIPS for "FREON-12" charged Systems



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## LEAK DETECTION and correction

General Search for Leaks. Leaks in refrigerating systems, particularly small ones, are often difficult to detect. Look for leaks at unions; at cylinder heads and valve plates; on either side of valves, fittings, gaskets and threaded connections. Time can often be saved by looking for an accumulation of lubricating oil which has leaked from the system.

Locating the Leak. Use a Halide lamp to detect and positively locate the leak. When testing, the "Freon-12" vapor escaping from the leak will cause the high temperature flame of the lamp to change to a bright green color. Use of the Halide lamp is the easiest and best method of detecting the most minute leaks.

To Isolate and Repair Leak. Close valves on both sides of leak, thus isolating it; relieve pressure in line by "cracking" or loosening the nearest connection, and remove gas from

BUY A WAR BOND EVERY MONTH

line to be repaired by blowing it out with air. Repair leak according to the problem at hand.

To Test Repaired Leak. Fill repaired section with inert gas, such as  $\mathrm{CO}_2$  or nitrogen, under pressure. Use about 10% "Freon-12" as a "tracer" and test with Halide lamp as covered in detection. Don't use compressor to develop air pressure in line. For accurate testing, avoid lighting Halide torch in the room if filled with "Freon" vapor. Don't fill test lamp with fuel in a room containing "Freon." The fuel will absorb the gas and give inaccurate readings. Kinetic Chemicals, Inc., Tenth & Market Sts., Wilmington, Del.

**NOTE:** This method of leak detection applies only to the "Freon" refrigerants.





It takes more than wishful thinking to connect with one in the "big time." There's where the real hitters show their stuff—bring to bear months and years of painstaking training. Eyes, muscles, nerves—all perfectly trained to coordinate on that next pitch.

## TRAINING



is for men who want to smash out a homer in the refrigeration and air conditioning field.

It is a course of sound, practical home-study instruction balanced with actual shop work; a program that helps prepare men to make the most of the opportunities offered in refrigeration and air conditioning. It's the kind of training that helps make league-leaders out of "rookies," as well as old-time service engineers.

Founded in 1927, U.E.I. has been training men in refrigeration SEVENTEEN consecutive years! There is nothing experimental or unproved in the U.E.I. Balanced Training method of helping ambitious men get farther faster. It's worked for years; it's working now.

Stop to think! Wouldn't this training help YOU in your present job—or the one you're aiming at? Then get busy and MAIL the COUPON below for FREE information. Don't wait until tomorrow—do it today, NOW.

#### MAIL THIS COUPON TODAY

UTLLITIES

FACTS	1314 W. Belden Ave. Chicago 14, III.
Please give me mor tion and Air Cond in your Refrigerationad.	e information about Refrigera- itioning Training, as promised on Service Engineer May, 1944
Name	
Address	
City	State

## PRODUCTION OF REPAIR PARTS SHOWS INCREASE

SERVICE managers who attended a recent domestic mechanical refrigerator industry conference with War Production Board officials said that production of repair and maintenance parts for refrigerators, as estimated by them, is much higher now than it was a year ago.

The amount of material made available by WPB is adequate, the industry representatives said, but shortages of manpower and facilities cause difficulties in the fabrication of the material. Facilities in the plants are used for war work to a large extent, and workers are being drafted in increasingly large numbers for service in the armed forces. Besides the problem of obtaining manpower for production of refrigerator parts, the industry is faced with the problem of maintaining adequately staffed repair shops in the field.

#### Replacement Program

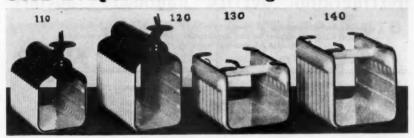
The industry is voluntarily carrying out a program under which inoperative functional parts are exchanged for new ones and reconditioned by the manufacturers. Other parts are salvaged by distributors or dealers. This program is proving highly successful, WPB reported. In some instances, as much as 90 per cent of the total amount of material originally allocated for the production of parts is being recovered.

It was pointed out that this practice had been followed, though on a limited scale, even before the war. Because of wartime shortages of materials, manpower, and facilities, the program has been expanded to apply to a longer list of refrigerator parts. In view of the continuing shortage of manpower, facilities, and materials, the industry group recommended that the present policy of exchanging functional parts be continued.

Alternating current motor production has been increased, industry members were told. About 85 per cent of total production is going into combat equipment, but enough AC motors are expected to be available for essential replacements for domestic mechanical refrigerators.

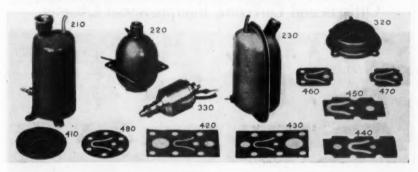
The Freon situation is improving slowly, WPB officials said. All requests for Freon for hermetically sealed units for household refrigerators are being granted by WPB.

#### Used Evaporators and High Side Floats



EVAPORATOR	S-FLOODED TIFE	1 1	-
110—2 Tray Goose Neck		PT	<u> </u>

Black, white and combination. On No. 110 and No. 120 leakproof lines \$2.50 extra



HIGH SIDE FLOATS Cleaned and Checked 210-For Westinghouse Units...

220—Ball Type ..... 230-For back of refrigerators. HAVE YOUR CROSLEY EVAP-ORATORS REPAIRED AND \$ REPLATED LIKE NEW ..

#### USED GENUINE WESTINGHOUSE PARTS IN GOOD CONDITION

		410-Discharge Valve Plate @.75
330-Unloader Valve	\$1.50	420-430-440-450-Valves @.50
	400-470-480-Valves	

FOR SALE—4 USED FIN COILS
Twelve %-inch Copper Tubes. Aluminum
Fins, % inches apart. 50% with order. Each,

We overhaul Mullens low side floats ......\$4.25 Frigidaire floats repaired. 3.75

#### Porcelain Evaporators—Refinished Like New

Kelvinator, Gibson and All Others; Leaks Welded, Reporcelained in Blue. We have on hand certain models of evaporators to exchange—no waiting. Send in your old evaporator—Exchange Price, \$12.50. NOTICE—Remove all fittings and no evaporator will be accepted with any welds.

All Prices F.O.B. Chicago, Ill.

#### ACME REFRIGERATION Telephone

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Columbus 4141

Chicago, III.

## Refrigeration Service Engineers Society

Official Announcements of the activities of the International Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.



#### THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

INTERNATIONAL HEADOUARTERS: 433-435 North Waller Ave., CHICAGO 44, ILL.

## Officers and Directors, Interprovincial Chapter



A group of officers and directors of Interprovincial Chapter, R.S.E.S., taken at fifth annual meeting held in Toronto. Left to right: T. W. Savill, Toronto, Past President: Bruno Lacerte, Montreal, Director: Charles Pigeon, Montreal, Second Vice-President; W. Sneath, Toronto, First Vice-President; W. Marshall, Toronto, President; E. G. McCracken, Toronto,

Secretary; A. J. Pike, St. John, N. B., Sergeant-at-Arms; G. Condie, Toronto, Treasurer. Back Row: A. Neilson, Calgary, Director; W. Bevis, London, Director; J. M. Turner, Montreal, Director. Front Row: C. O. Cunningham, London, Director; W. Podd, Ottawa, Director; J. W. McKee, Toronto, Director; R. O'Connell, Toronto, Director.

## R.S.E.S. Chapter Notes

#### CHICAGO CHAPTER

THE feature of the March 14 meeting was a demonstration of the installation of a Chicago Seal on a Coldspot unit performed by A. E. Karlberg, member of the Chapter, who manufactures the seals. He has devised a tool to remove the old seal from the Coldspot without the necessity

of pulling apart the compressor. A great deal of interest was shown in this demonstration by the members. The unit was charged up by a new member, Floyd Lillee and the gas was contributed by Fred H. Stevens. Joe Freed furnished the tools, Al Gordon furnished the Hermetic tool for charging and the gauge and accessories were supplied by Floyd Lillee.

In absence of the president, installation of the new officers was ably performed by Secretary Ivar Skipple. Officers were in-

## CHICAGO CHAPTER MEMBERS AT WORK AND AT PLAY



Edward Deutschmann, Herman Goldberg, J. O. Habich, F. H. Stevens.



Alex Gordon, Secretary; Jos. Barys, Sgt.-at-Arms; Pete Bendl, Chairman Educational Committee; Jos. Freed, Treasurer; Harold Getty, President.



A. E. Karlberg conducts demonstration on replacing seal on Coldspot refrigerator with Chicago seal.

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FACTORY TESTED PARTS

stalled as follows: President, Harold Getty; First Vice-President, Meyer Axelrod; Second Vice-President, Albert Des Rosiers; Secretary, Alex Gordon; Treasurer, Joseph Freed; Sergeant-at-Arms, Joseph Barys; Chairman of Educational Committee, Pete Bendl; Board of Directors, H. D. Busby,

John Habich, E. Deutschmann, F. H. Stevens and Herman Goldberg.

Herman Goldberg gave a very interesting talk covering the history of the Chapter He also spoke of the postwar opportunities for refrigeration service. He gave a preview of the Chicago Valve Plates and said he would appreciate suggestions from service men regarding the kind of plate most in demand.

#### KANSAS CITY CHAPTER

March 1—The meeting was held at the Schreiber Institute of Refrigeration, 902 Westport Road. Applications for active membership were read from Chas. R. Ganzer, L. A. Nelson and Elman Davison.

Reporting for the entertainment committee, E. L. Tramposh said they had obtained the Roof Garden at the Ambassador Hotel for the annual dinner dance. Mr. Schreiber, Chairman of the Education Committee, explained the operation of a machine which he had set up connected to a coil. On it had been placed several thermometers by which he figured the BTU capacity of the machine and also the wattage consumption.

The Chapter held its ninth annual dinner dance on the Roof Garden of the Ambassador Hotel Saturday evening March 18. Approximately 125 people attended and the fried chicken dinner was enjoyed by all. E. L. Tramposh acted as Master of Ceremonies.

An interesting program was presented including song and dance numbers after which the evening was spent in dancing.

#### LONE STAR CHAPTER

April 7—The following officers were elected: President, C. M. Black; Secretary and Treasurer, H. H. Seale. Following the election of officers, membership applications were received from 10 new members.

After the meeting had adjourned, supper was served followed by two pictures, "Sand and Flame" and "On Two Wheels" by C. J. Gilbert, through the courtesy of General Motors.



Wartime manufacturers of Electro-Magnetic and Temperature Controls for Aircraft

Peacetime Producers of Automatic Pressure, Temperature, General Controls K-15, two-wire, current failure, is a high pressure valve handling large capacities with minimum pressure drop. Main valve held open electrically minimizes pressure loss. Packless, available normally closed. Operates on wide variety of fluids and gases.

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#### TWIN CITIES CHAPTER

and Flow Controls.

April &—Routine chapter business occupied the attention of the members at the April 4 meeting. In a report on the by-laws, Art Palen suggested that the membership committee review the Chapter's by-laws and make a report to the members. The Secretary presented a report from the meeting held with the steamfitters business agent in regard to the proposed city license covering refrigeration men. A suggestion was made by Art Palen that the Chapter keep in touch with the State license law.

Membership applications were accepted from Carl Louis Held and George Lineham

A very interesting demonstration was conducted by John Weiner.

#### TRI-STATE CHAPTER

At the regular March meeting, the following officers were elected to serve during the coming year: President, A. W. Albertsen; Vice-President, Monroe Chase; Second Vice-President, A. W. Gruber; Secretary, Joe Campbell; Treasurer, Claude A. Brunton.

R. H. Amick, owner of Amick Refrigeration Service, Charleston, W. Va. was accepted as a member. Ben DeRond, Jr., former member of the Chapter, who is now a sergeant in the Army, was reinstated into membership.

#### WICHITA CHAPTER

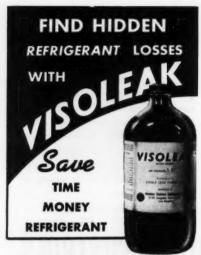
March 10—The National Service Training Program which was being started in Wichita was the chief subject of discussion at the March 10 meeting.

#### MILE HIGH CHAPTER

April 10— The seven members present at roll call voted to fine the late comers one cent for each minute they were late. This resulted in \$1.30 being collected, which was ear marked for the refreshment fund.

The membership committee was instructed to look further into the type of award to members giving educational talks.

The Secretary read a letter from the National Office which outlined the R.S.E.S. Service Engineers employment bureau and the membership drive. The idea was greeted with much enthusiasm, and everyone agreed that it was a very worthwhile undertaking.



IT'S SIMPLE -

Just place VISOLEAK in the high side of the system. This finely-treated colored refrigerant oil will penetrate every nook and cranny and spot those hard-to-find leaks. If refrigerant can leak out, so can VISOLEAK. A red stain will mark the leak for your instant repair.

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Made from the finest oils, it's non-toxic, non-poisonous, non-corrosive and non-inflammable. Can be used safely and effectively with ANY refrigerant.

#### IT'S ECONOMICAL -

Wholesale Prices		Save 10% on case lots
4 ounce bottle	\$1.00	48 bottles
8 ounce bottle	1.75	24 bottles
1 pint bottle	3.00	24 bottles
1 quart bottle	5.00	12 bottles
1 gallon can	16.00	6 cans

See your jobber or write for complete information

WESTERN THERMAL EQUIPMENT COMPANY 5/4/ Angeles Vista Bivd., Los Angeles 43. Cal Please send me complete details about VISOLEAK.

Name

The membership application of Charles T. Brown was accepted and an R.S.E.S. lapel button awarded to his brother, Arthur Brown, for being the first to bring in a new member.

Lyle Smith was appointed Chairman of a committee to arrange for a social meet-

H. R. McCombs, Chairman of the educational committee introduced L. W. Barley, who conducted another question and answer contest.

#### BOSTON CHAPTER

April 11—As the meeting was scheduled for the annual Banquet and Ladies Night, the regular Chapter business was dispensed with. After enjoying a very fine dinner, the members and guests were attentive while Past President, A. E. Alexander, installed the newly elected officers. Following the installation, very pleasing entertainment was provided by James McCue, Chairman of the educational committee.

#### TOLEDO CHAPTER

April 12—The business meeting was brief to provide more time for the annual fish fry and other entertainment. Twenty-three members were present for the event which included three interesting moving pictures, besides food and drink.

#### MOUNT ROYAL CHAPTER

March 15—A. Gendron, Chairman of the entertainment committee, reported on the supper dance which was a very successful event. Mr. Lacerte, Chairman of the membership committee, reported three new members: Leo Letourneau from St. John, G. L. Brossard and E. Roy from Warwick.

Two delegates were named to represent the Montreal Chapter to the Inter-Provincial Association, Robert McCullough and C. E. Pigeon. Seventeen members said they expected to attend the Toronto conference.

The speaker of the evening, R. M. McCall, conducted a "True or False" quiz. This proved to be very interesting.

#### HUDSON-MOHAWK CHAPTER

April 14—The following officers were elected for the coming year: President, Joseph Dayton; Vice-President, E. C. Wilkinson; Secretary and Treasurer, George B. Gardner; Sergeant-at-Arms, J. Gibbons; Directors, R. Feathers and Carlton Michel.

Previous to the meeting, all members enjoyed a dinner and the balance of the meeting was devoted to selective service questions, training program and the coming meeting of officers and directors of the New York State Association to be held in Buffalo. Joseph Dayton was appointed as delegate and Carlton Michel alternate to attend the State meeting.

#### CORN BELT CHAPTER

April 19—Albert Bailey, Chairman of the membership committee presented applications for membership from Ralph E. Porter and Roy Hunter, both of which were accepted.

It was announced that R. L. Hendrickson had been appointed a member of the Wartime Educational Committee of the R.S.E.S. at the request of Paul Reed.

A very enlightening and entertaining talk was given by R. L. Hendrickson on the new F-22 refrigerant, its properties and characteristics. Various applications of the new refrigerant were pointed out.

It was décided that the next meeting would be held at the office of the Manufactured Ice Co. and that following the meeting, a tour would be made through the plant.

#### WESTERN MASSACHUSETTS CHAPTER

April 26—At this meeting, the Central Connecticut Chapter joined for the evening's pleasure which consisted of a lecture by Joseph Slattery on the Cycle of Refrigeration by the Relative System. Messrs. Lindberg and Fassel showed several motion pictures, including Esso's System of Testing Oils, a war picture and a comedy.

#### MAGNOLIA CHAPTER

March 22—Thirteen members were presented at roll call. A motion was passed that if any member of the Chapter enters any branch of the service of the United States, the Chapter would pay his national dues and suspend his local dues for the period of his enlistment.

April 12—This was an educational meeting, 12 members being present. L. B. Brummett, Chairman of the publicity committee reported some progress on the subject of advertising but further discussion was deferred until the next meeting.

#### ONTARIO MAPLE LEAF CHAPTER

March 10—O. B. Fraye placed before the members the names of those which he intended to put on the honor roll and requested a discussion regarding any possible errors or omissions.



The Aerovox Victory Line of 30 universal types can take care of upwards of 90% of all motor-starting capacitor replacements. Handy Aerovox conversion chart indicates Victory equivalent for any previously available type. • Ask your jobber about these Aerovox Victory replacements. Ask to see the Aerovox conversion chart. • Or write us direct.



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#### Commercial Trades Institute

Chicago, III. 221 N. La Salle St. Birmingham, Ala. 200 S. 20th St. Bloomington, III. 300 E. Grove St.

President J. Spence asked for an expression of opinion regarding the licensing of service men. K. Wood then discussed at some length the I.P.A. bulletin which was being mailed to the members covering deferment and also pointed out the status of the refrigeration service men now in relation to Selective Service.

Officers for the coming year were elected as follows: President, W. Sneath; First Vice-President, H. Donnell; Second Vice-President, R. O'Connell; Secretary, R. G. Henderson; Recording Secretary, F. C. Strong; Treasurer, G. A. Burns; Sergeant-at-Arms, C. J. Smith; Board of Directors, J. Spence, J. McGurn, A. Olmstead, D. Fowler, V. Skinner, K. Williams and C. Racioppa.

April 12—H. F. Nye gave a very favorable report on a recent banquet and dance. It was agreed that the admission charge to the social evening to be held Friday evening, April 21, would be \$1.00 covering entertainment and refreshments.

A letter was read by K. Wood regarding an employment bureau being instituted by the International Office as a postwar measure. After the reading of this letter, the Secretary was requested to write the I.P.A. expressing interest in the employment bureau and stating that they would be glad to meet with the executives of the I.P.A. to discuss the formation of a Canadian counterpart.

## Ladies Auxiliary

#### KANSAS CITY AUXILIARY

March 1—The March meeting was held at the home of Mr. and Mrs. J. P. DeWilde. Arrangements were made to send cards to all R.S.E.S. men in the service on all holidays. The entertainment committee provided a contest in which a prize was offered for the most complete list of axioms, plus a story composed of the titles of songs. It was won by Mrs. C. R. Visger.

#### NIAGARA FRONTIER AUXILIARY

April 14—The regular monthly meeting was held at the home of Mrs. A. H. Keirn. It was decided to hold the Niagara Frontier annual dinner and theater party Wednesday evening, May 3, the dinner to be at Lorenzo's. Mrs. A. H. Keirn was appointed in charge of entertainment.

#### ROCKFORD AUXILIARY

April 17—At this meeting, it was decided that the next meeting would be held at the home of the President, Mrs. Roy Shipman at which time a gift would be presented to the new baby, Cheryl Kay, born March 30. After the meeting, arrangements were made for a pot luck lunch.

#### 2 2 2

## NEW FORGED STEEL REFRIGERANT PURGER ANNOUNCED

A FORGED steel purger for removing air and other non-condensible gases from refrigerating systems has been developed by the Armstrong Machine Works, Three Rivers, Michigan, who also manufacture cast semi-steel purgers. The forged steel purger is designed for high-pressure CO<sub>2</sub>, ammonia and freon systems and for service where engineers prefer the quality of all steel construction.

This purger is hooked up to both the condenser and receiver and is reported to keep the system free of non-condensibles with no appreciable loss of refrigerant gas. The unit is fully described in a new bulletin, No. 160, which discusses non-condensible gases, and gives complete data on Armstrong purgers, with specifications and prices.

#### 222

#### HONEYWELL ADVANCES METCALF

A PPOINTMENT of Ralph H. Metcalf as Zone Supervisor for the air conditioning controls division in the Cleveland area has been announced by the Minneapolis-Honeywell Regulator Company, Minneapolis, Minn. For the past eight years, Metcalf has specialized in air conditioning controls, making his headquarters in the St. Louis office of the company and at the main plant. He has supervised installation of air conditioning controls in many of the mid-western war plants built since 1939.

#### x x x

## ANSUL APPOINTS NEW MANAGER PILOT PLANT DEPT.

THE appointment of Carl L. Wallfred of the Batelle Institute, Columbus, Ohio, as Manager of its Pilot Plant Department has been announced by Ansul Chemical Company, Marinette, Wisc. Mr. Wallfred, a graduate chemical engineer of the University of Minnesota, who was a metallurgist at the Batelle Institute, took over his new work at Ansul on April 1.





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RECENT WPB BULLETIN

Maybe in past years you have not been accustomed to stocking parts and supplies to take care of your summer "peak," but this year WPB urges you to anticipate as far in advance as possible. That means just one thing: Go through your AiRO catalog, page by page, and order your needs today. Of course, if you haven't a copy of AIRO's Victory Catalog, we'll send you one promptly. (Please write on your letterhead.)

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Dept. A. 2732 N. Ashland Ave., Chicago 14, III.
Refrigeration Parts, Equipment, and Supplies

#### ANSUL OPENS NEW OFFICE

A NEW office, providing much needed additional room, will be opened about May 1 in New York City by Ansul Chemical Company, Marinette, Wisconsin. The company has leased space in the Lincoln Building at 60 East 42nd Street. Dugas Engineering Corporation an Ansul subsidiary, will occupy the same quarters. T. R. (Bob) Kearney will handle the Ansul line and Glen Stratton will be in charge of Dugas activities.

#### x x x

## STRELINGER ELECTED TREASURER OF NASH-KELVINATOR

A NNOUNCEMENT has been made that Godfrey Strelinger, formerly assistant to the general sales manager, Nash Motors Division, has been elected treasurer and assistant secretary of Nash-Kelvinator Corporation filling the post recently vacated by the death of G. V. Egan.

Mr. Strelinger has spent 15 years with Kelvinator and later with Nash following merger of the two companies in 1937. "As treasurer," said the statement, "his unusually wide field of experience will be employed to carry on plans already under way to further the Corporation's war production program and advance its postwar position." The company also announced that Strelinger has been elected a director and secretary-treasurer of its subsidiary, Refrigeration Discount Corporation.

#### x x x

## BRUNNER N. Y. DISTRICT MANAGER HAS NEW ADDRESS

W. MATHEWS, Brunner 1 EORGE Manufacturing Co. New York district manager, who has been operating from temporary quarters since his recent appointment, is now permanently located at 340 West Fifty-seventh street, New York, according to an announcement to the trade by B. J. Scholl, sales manager. Previous to his accepting the New York post, Mr. Mathews had served the Brunner organization in the Detroit and Chicago territories. The position had been left vacant following the untimely death of Norman J. Cowles, previous incumbent, last November. The Brunner organization, at present working on equipment for the war effort, is a large peacetime producer of condensing units used in many industries.



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JOBBERS: WRITE FOR SPECIAL PROPOSITION!

## ALCO VALVE COMPANY AWARDED ARMY-NAVY "E" CITATION

In recognition of "outstanding achievement in war production," the Alco Valve Co., 865 Kingsland Ave., St. Louis, Mo., designers and manufacturers of refrigeration and air conditioning control valves, was awarded the Army-Navy "E" citation in a colorful ceremony in the Ward Junior High School Auditorium, March 29. The entire program was broadcast over Radio Station KWK, St. Louis.

In his presentation of the "Excellence" flag, Rear Admiral Wat T. Cluverius, U.S.N. (Ret.), president of the Worcester (Mass.) Polytechnic Institute, said the contribution of the company to the war effort had been vital, its work being a part of the equipment of every ship of the fleet.

Arthur B. Schellenberg, president of Alco, who received the pennant on behalf of the organization, emphasized the importance of recognizing today's realism without losing sight of our ideals. He recalled that, prompted by strong idealistic motives, they had started production of war materials long before Pearl Harbor.



Presentation of Army-Navy "E" Award to Alco Valve Co., March 29, 1944. Left to right: Lucretia Crain and Mary Monett, Waves; Rear Admiral Wat T. Cluverius, USN; President Arthur B. Schellenberg of Alco; Col. Lawrence L. Conrad; June Crain, Wave, twin sister of Lucretia.

Citation pins were presented by Col. Lawrence L. Conrad, to three representatives of Alco employees: Emma M. Winking, Lester F. Koeneman, and John Baumunk. Miss Winking responded.

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#### CATALOGS AND BULLETINS

THE COMMERCIAL TRADES INSTITUTE has published a 12 page booklet announcing courses in air conditioning and refrigeration available to civilians for either resident or home study training. Heretofore this Institute directed by C. J. Freestone, chief refrigeration engineer of the Sixth Service Command has been instructing men for the U. S. Army. It is now in position to train civilians in this line of work.

Three schools are in operation, in Birmingham, Ala.; Bloomington, Ill., and Chicago. Willis Stafford is director of instruction in the Chicago School, R. L. Hendrickson who is now a member of the Wartime Educational Committee of the Refrigeration Service Engineers Society is director at Bloomington, and E. V. Oakwood is director of the school at Birmingham, Ala. All the instructors are members of the Refrigeration Service Engineers Society. The laboratories of all schools are fully equipped with a variety of refrigeration equipment.

A copy of this pamphlet may be obtained by writing the Commercial Trades Institute in Chicago.



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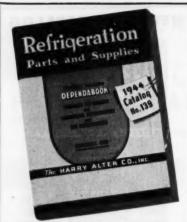
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## OF AUTO-DIESEL LADLE TEMPERED PISTON RINGS have been Used

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diesel powered units of all types—stationary and mobile units and for hydraulic and pneumatic operated industrial equipment. In the future, the AU-TO-DIESEL organization will continue with the same high standard of quality it started with nearly a quarter of a century ago.

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QUALITY RINGS SINCE 1921

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HELP WANTED—Shop Mechanic, experienced on household sealed and open type units. Steady position with a well established and growing concern in Brooklyn, N. Y. Also experienced outside serviceman. Give full particulars and salary expected. Address Box AP-2, Refrigeration Service Engineer, 435 N. Waller Av., Chicago 44, Illinois.

SITUATION WANTED—I will operate your service and repair department in any home appliance firm West of the Rockies, by lease or manager's assignment. Seasoned experienced on refrigerators, vacuums and electrical appliances. Address communications to Post Office Box 727, Long Beach 1. California. California.

WANTED TO BUY—A complete used course on "Refrigeration and Air Conditioning" published by Industrial Training Institute, copyrighted 1940 or later, or same material by I.C.S. Refrigeration separate also acceptable. Address Box MY-4, Refrigeration Service Engineer, 435 N. Waller Ave., Chicago 44, Illinois.

WANTED TO BUY—SERVICE DRUMS. Will pay more than new cost for small or medium size. If you have drums not in use, you can help the war effort and make a profit by selling to those who need them. Drums need not be in perfect condition. Doolin Refrigeration & Appliance Service, Box 873, Pryor, Oklahoma.

HELP WANTED — Experienced refrigeration serviceman. Salary to start \$60.00 per week. Truck furnished. Excellent opportunity for right man. Steady employment guaranteed. T & R Supply Co., Inc., 278 West Court St., Kankakee, Illinois.

HELP WANTED—Refrigeration shop superintendent. Must have ability to train and handle men. Thorough knowledge compressor rebuilding, motor repairs, and general shop practice. Permanent position well established oganization. Advise experience and salary requirements first letter. Address Box MY-3, Refrigeration Service Engineer, 435 N. Waller Ave., Chicago 44, Illinois.

FOR SALE—200 Frigidaire Model "O" ½ h.p. \$65.00. 300 Frigidaire Model "K" ½ h.p. \$35.00. 200 Kelvinator Model 5563 ½ h.p. \$42.50. Two, four, six hole converted ice cream cabinet. All units are in running condition, air cooled with 60 cycle 110-220 volts motors. All orders F.O.B. New York. 25% deposit with order. Send for surplus stock catalogue. Edison Cooling Corp., 310 E. 149th St., New York 51, N. Y.

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